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Pickrell

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[54] **READILY DETACHABLE WATER SKI TOWLINE PAY-OUT AND RETRIEVAL APPARATUS**

[76] Inventor: **John W. Pickrell,** 4206 N. 68th St., Scottsdale, Ariz. 85251

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[52] **U.S. Cl.**..... **242/86.5 A,** 114/235 WS, 242/156

[51] **Int. Cl.**..... **B65h 75/40**

[58] **Field of Search**..... 242/86.5 A, 86.5 R, 100, 242/106, 156; 114/235 WS

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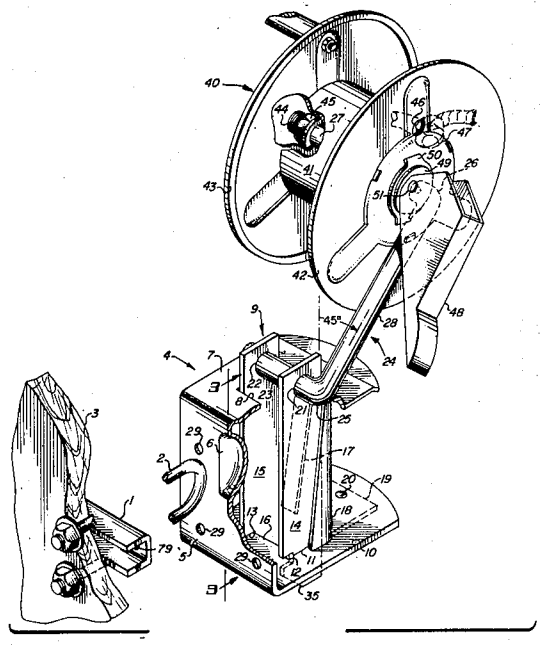
Primary Examiner—John W. Huckert
Assistant Examiner—Edward J. McCarthy
Attorney, Agent, or Firm—Cahill, Sutton & Thomas

[57] **ABSTRACT**

Water ski towline reel apparatus is disclosed which may be detachably affixed to a semi-permanently fixed bracket disposed at the rear of a towboat. An elongated rod is provided with two right angle bends directed such that the rod ends are parallel to one another. An outer rod end is adapted to receive the reel acting as the shaft therefor. The inner rod end is welded to a channel member after being inserted through aligned holes in opposite sides and near one end thereof. The channel member is provided with a pair of notches near its other end and is adapted to pass vertically through a pair of apertures in a U-shaped mounting bracket affixed to the rear of a towboat. The length of the channel member is sufficient for the end carrying the reel shaft to clear the upper surface of the upper bracket leg when the notches engage the lower bracket leg. Spring loading means bearing on the side of the channel member urge the notches into such engagement until it is desired to remove the reel apparatus from the bracket. When such removal is to be effected, the channel member is pushed against the spring means to disengage the notches from the lower bracket arm such that the channel member and reel assembly may be lifted through the apertures in the channel arms for remote storage.

A three position friction brake variably bears against one side of the reel to achieve locking, restraining, and free-running operation as may be required during use of the apparatus. The rope is fed through the channel member beneath the inner rod end in order to provide a safety factor in which a knot in the rope near the attached end is stopped, because of its size, between the rod end and the upper surface of the upper bracket leg. Thus, any sudden strain resulting from complete pay-out of the towline from the reel is taken by the bracket rather than the reel.

4 Claims, 8 Drawing Figures



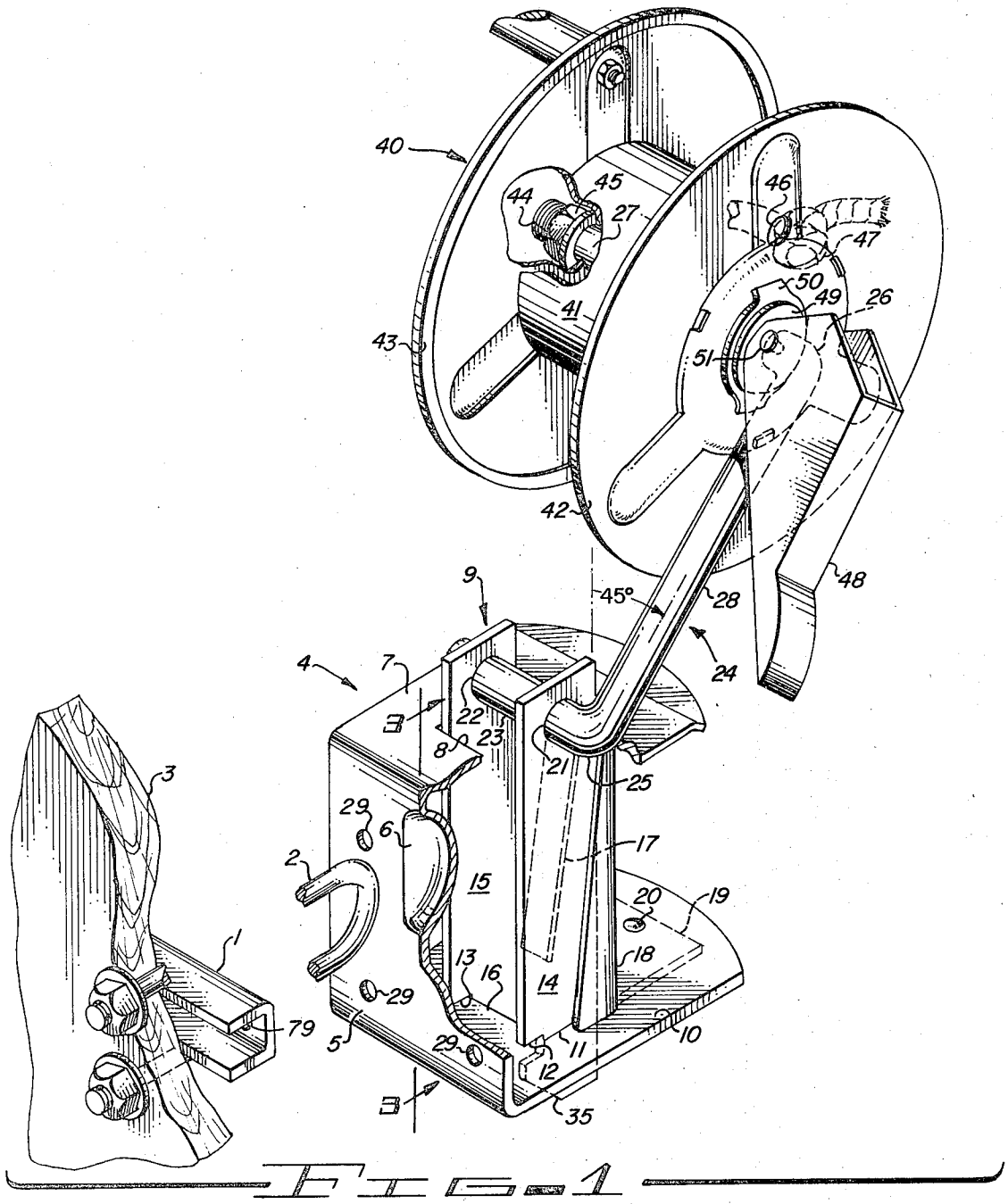

40
45
44
27
46
47
50
49
26
41
43
51
42
48
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45°
28
24
4
7
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8
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29
6
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2
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1
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16
14
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79
5
29
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10
12
3
35

Fig-1

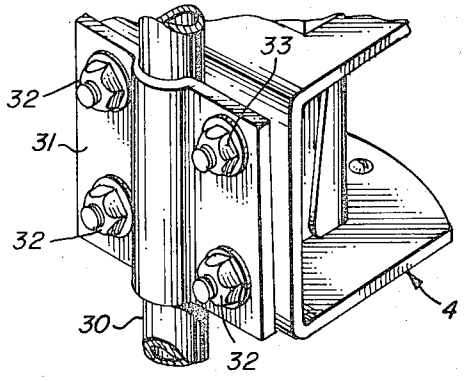

33
32
31
32
30
32
4

Fig-2

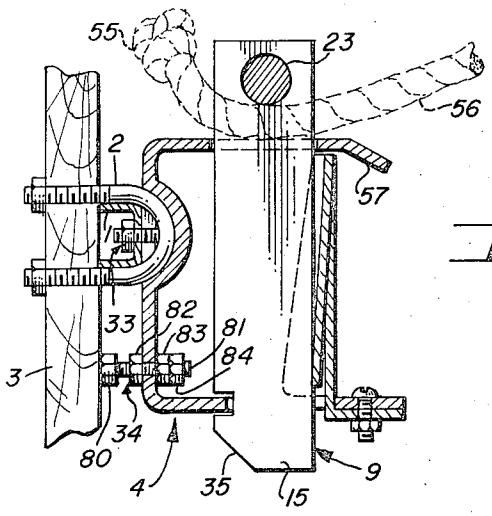


Fig-3

Fig-6

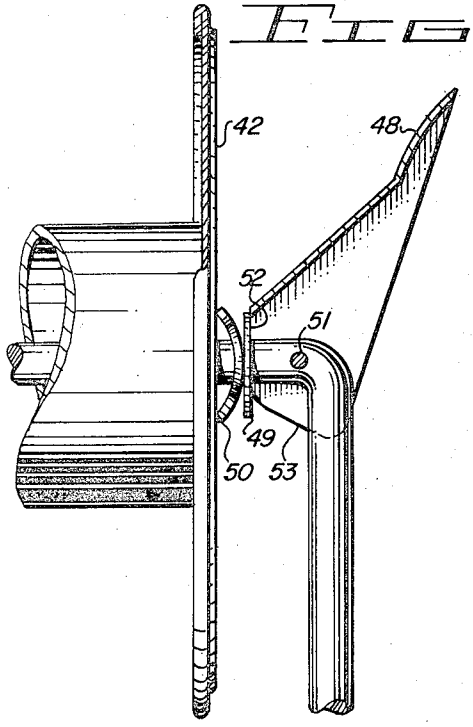
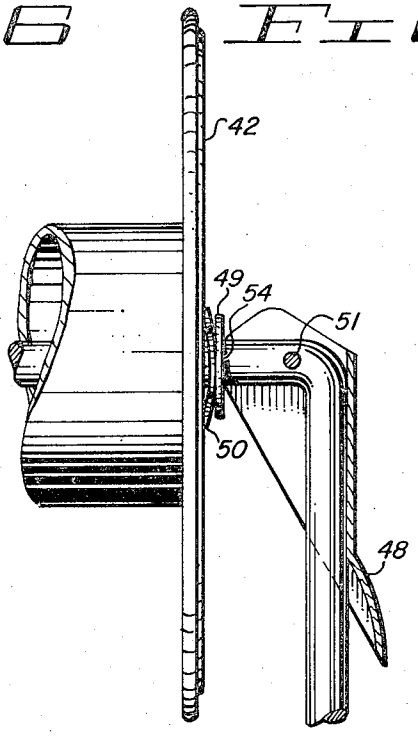


Fig-8



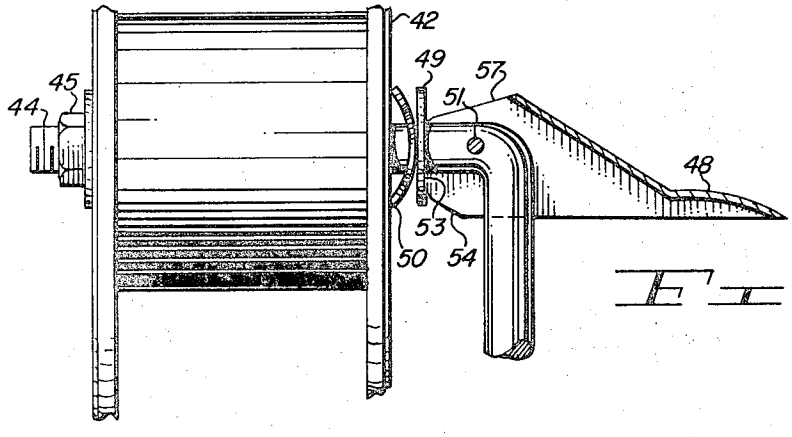


Fig-7

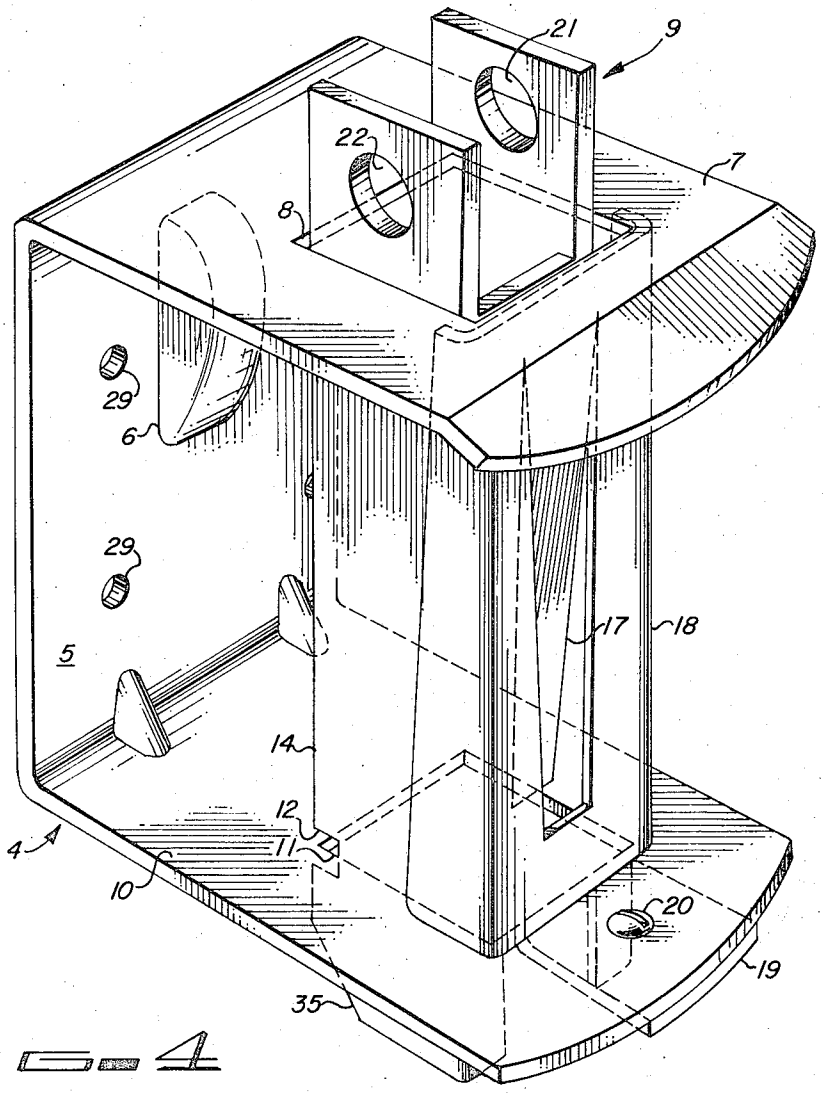


FIG. 4

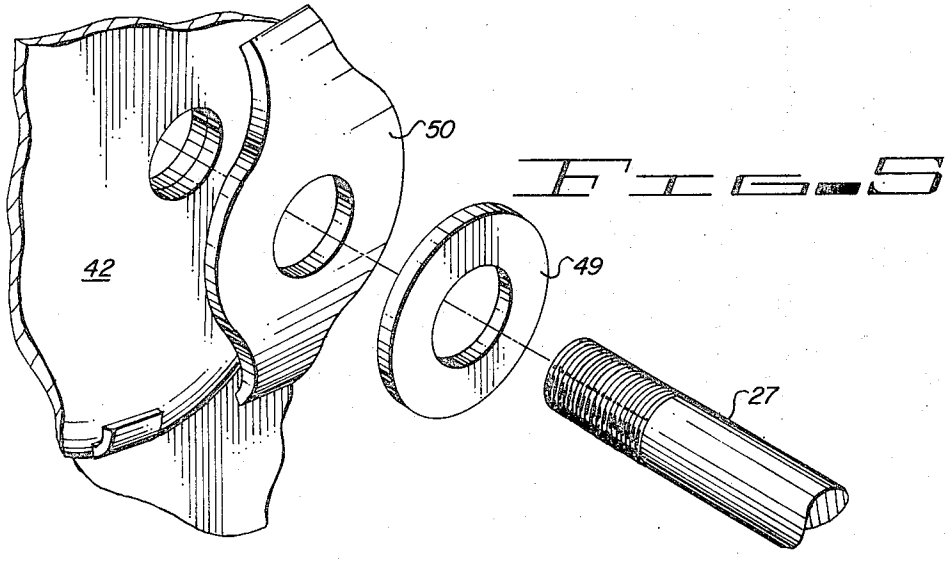


FIG. 5

READILY DETACHABLE WATER SKI TOWLINE PAY-OUT AND RETRIEVAL APPARATUS

This invention relates to reel apparatus for water skiing towropes and, more particularly, to such apparatus which may readily be detached from the rear of a towboat for storage.

The sport of water skiing has become very popular such that a variety of apparatus is commercially available for providing pay-out, retrieval, and temporary storage functions for the towropes. This apparatus most commonly takes the form of a reel more or less permanently attached to the towboat by suitable adapters. However, during normal, non-skiing, use of the towing watercraft, the rope handling apparatus common in the prior art remains in its operating position in which it becomes a nuisance. The position of the rope handling means, during skiing operations, must be readily accessible to facilitate proper manipulation. However, this very accessibility becomes a disadvantage during non-skiing use of the watercraft to such an extent that those skilled in the art will appreciate the desirability for providing rope handling apparatus which can be detached from its normal operating position for storage remotely in a convenient place. Further, such remote storage insures the availability of an untangled supply of rope in good condition for skiing or other use.

It is therefore a broad object of my invention to provide improved water ski towline pay-out and retrieval apparatus.

It is a more specific object of my invention to provide such apparatus which may be readily detached from its normal operating position for storage.

It is a further object of my invention to provide such apparatus which is simple and of ready and economical manufacture but is nonetheless safely and securely fixed in its operating position during use.

The subject matter of the invention is particularly pointed out and distinctly claimed in the concluding portion of the specification. The invention, however, both as to organization and method of operation, may best be understood by reference to the following description taken in connection with the accompanying drawings of which:

FIG. 1 is a partially cutaway, partially exploded view illustrating the apparatus of the present invention in assembly and further illustrating one configuration for securing the mounting bracket therefor to the rear of a boat;

FIG. 2 illustrates a common variant means for fixing the mounting bracket to a boat;

FIG. 3 is a cross-sectional view taken along the lines 3—3 of FIG. 1 further clarifying the manner in which the mounting bracket may be fixed to the rear of a boat;

FIG. 4 is a partial assembly view in perspective illustrating the elements which render the apparatus detachable;

FIG. 5 is an exploded detailed view illustrating a variable braking mechanism associated with the reel means of the apparatus;

FIG. 6 illustrates the variable brake means in a first position thereof;

FIG. 7 illustrates the variable brake means in a second position thereof; and

FIG. 8 illustrates the variable brake means in a third position thereof.

With reference now to FIG. 1, it will be observed that a retaining clip 1 is positioned within the towing eye 2 on the rear or stern portion 3 of a watercraft. A generally U-shaped bracket 4 is provided, on the connecting side 5 facing the retaining clip 1, with an indentation 6 dimensioned and configured to accommodate the towing eye 2.

The upper leg 7 of the bracket 4 is provided with a rectangular aperture 8 for receiving vertical channel member 9. Similarly, lower leg 10 of the bracket 4 is provided with a rectangular aperture 11 for receiving the lower portion of the channel member 9. Notches 12 and 13 in the lower forward portion of the respective sides 14 and 15 of the channel member 9 engage the lip 16 just forward of the aperture 11 in the attached, operating position. As will become more apparent as the description proceeds, the channel member 9 is normally maintained in this position by the action of spring 17 which urges the channel member forwardly. Spring 17 depends from spring support 18 which, in turn, is held in position by rearwardly extending plate portion 19. The plate portion 19, integral with the spring support 18, is fixed beneath the lower leg 10 of the U-shaped bracket 4 by screw 20.

Aligned holes 21 and 22 extend through the walls 14 and 15 of the channel member 9 near the upper end thereof to receive the lower end 23 of reel shaft member 24. Reel shaft member 24 includes first and second right angle bends 25 and 26 which are oriented such that the upper end 27 of reel shaft member 24 is parallel to the lower end 23 thereof. The connecting section 28 between the two bends 25 and 26 of the shaft member 24 is oriented generally rearwardly and upwardly with respect to the channel member 9 to which it is fixed. Preferably, welds are made between the lower end 23 of the shaft member 24 and the channel member 9 at the apertures 21 and 22 with the angle between the vertical and the connecting section 28 of the shaft member 24 approximating 45°.

A plurality of mounting apertures 29 are provided in the connecting side 5 of the U-shaped bracket 4 to facilitate securing the bracket 4 to boats of various hardware configurations. For example, as shown in FIG. 2, the mounting bracket 4 may be fixed to a vertical railing 30 by utilizing a clamp 31 in conjunction with nut and bolt assemblies 32. The specific means for securing the bracket 4 to the rear of the towcraft will vary according to the specific installation.

However, perhaps the most frequent installation is over the towing eye 2 (as shown in FIGS. 1 and 3) which is positioned at a location determined to be suitable for towing for the particular boat. Thus, as best shown in FIG. 3, the retaining clip 1 is positioned interior to towing eye 2 and attached to bracket 4 by nut and bolt assemblies 33 engaging the apertures 79 within the retaining clip and the corresponding apertures 29 in the bracket. The vertical orientation or alignment of channel member 9 is adjusted by nut and bolt assembly 34. That is, the head 80 of the bolt is positioned against the stern 3 with the shank 81 penetrating one of the lower apertures 29 of bracket 4. Positioning nuts 82 and 83 maintain bracket 4 therebetween in a spaced relationship with respect to stern 3. By varying spacing between the stern and the positioning nuts, the lower part of bracket 4 will be repositioned by a corresponding amount while pivoting about the towing eye 2. Thereby, the vertical alignment of

channel member 9 (being connected to bracket 4) is altered by an amount corresponding to the repositioning of the lower part of bracket 4. A locking nut 84 prevents inadvertent loosening of the positioning nuts 82 and 83.

FIG. 4 illustrates the manner in which the channel member 9 is detachably fixed to the bracket 4. As previously noted, the spring 17 carried by the spring support 18 urges the channel member 9 so that the notches 12 and 13 (see also FIG. 1) engage the lip 16 just forward of the aperture 11 in the lower leg 10 of the bracket 4. To remove the channel member 9, the lower end thereof may be moved manually against the spring 17 until the notches 12 and 13 disengage the lip 16. In this position, the channel member 9 may simply be pulled upwardly through the apertures 11 and 8 for removal of the reel assembly (not shown in FIG. 4 for clarity) which may then be stored in a convenient place. To reattach the channel member 9 and reel assembly supported thereon, the channel member 9 is first introduced into the rectangular aperture 8 in the upper leg 7 of the bracket 4 and is pushed downwardly until the angled edge portions 35 and 36 (see also FIG. 3) at the bottom end of the channel sides 14 and 15 abut the forward edge of the aperture 11. Continued downward pressure forces the bottom end of the channel member 9 rearwardly as the angled edge portions 35 and 36 slide along the forward edge of the aperture 11 until the notches 12 and 13 snap into position. The apparatus is then in the operating configuration.

Referring again to FIG. 1, the reel assembly 40 includes a hub 41 extending between sides 42 and 43. The upper end 27 of the reel shaft member 24 terminates in a threaded portion 44. Thus, the reel assembly 40 is supported for rotation about the upper end 27 of the shaft member 24 and is secured thereon by nut 45 fitted to the threaded portion 44. An aperture 46 through the side 42 of the reel assembly 40 positioned slightly beyond the outer surface of the hub 41 permits the towline to be secured to the reel assembly by simply tieing the knot 47.

During normal operation, different functions require that the reel assembly be completely free to rotate with a relatively moderate amount of braking action and be effectively braked against rotation. These three levels of operation are controlled by manually adjusting the position of brake lever 48 which bears against washer 49 which, in turn, bears against spring washer 50. The pressure exerted by spring washer 50 on the side 42 of the reel assembly 40 is varied by adjusting the position of the brake lever 48 about its pivot pin 51 which passes through the shaft member 24 proximate the right angle bend 26. Reference may be taken to FIG. 5 which illustrates, in exploded view, the relationship between the upper end 27 of the shaft member 24, the washer 49, the spring washer 50, and the side 42 of the reel assembly 40.

FIG. 6 illustrates the reel assembly with the brake lever 48 in the "free wheeling position" which would be utilized, for example, in rewinding the towrope after use. It will be noted that the distance between the pivot pin 51 and the edge 52 of the brake lever 48 is less than the distance between the pivot pin 51 and the edge 53 of the brake pin. Similarly, the distance between the pivot pin and the edge 54 is greater than the distance between the pivot pin and the edge 53. Therefore, with the brake lever in the position shown in FIG. 6 in which the edge 52 bears against the washer 49, the least pressure is exerted by the spring washer 50 on the side 42 of the reel assembly.

In FIG. 7, the brake lever 48 is shown in the "restraint" position in which the edge 53 bears against the washer 49. In this position, the spring washer 50 is forced somewhat inwardly against the side 42 of the reel assembly to apply a moderate amount of braking force to avoid overrun during an unreeling operation.

The reel assembly may be locked against rotation, which would be desirable when the towline is deployed to the extent desired or is fully wound on the reel and not in use, by shifting the brake lever 48 into the position illustrated in FIG. 8. The edge 54 has forced the washer 49 inwardly to exert considerable force on the spring washer 50 to apply substantial friction braking to the side 42 of the reel assembly.

In order to prevent undue strain being placed upon the reel assembly 40 when the towline is fully played out, the towline is preferably passed around the lower end 23 of the reel shaft member 24. As shown in FIG. 3, the knot 55 may be tied near the inner end of a towline 56 in order that the knot 55 will jam between the lower end 23 of the reel shaft member and the upper surface of the upper leg 7 of the bracket 4 before any strain is placed on the reel assembly 40. The trailing edge 57 of the upper leg 7 of the bracket 4 is preferably angled downwardly to avoid chaffing the towline 56.

While the principles of the invention have now been made clear in an illustrative embodiment, there will be immediately obvious to those skilled in the art many modifications of structure, arrangement, proportions, the elements, materials, and components, used in the practice of the invention which are particularly adapted for specific environments and operating requirements without departing from those principles.

I claim:

1. Watercraft towline pay-out and retrieval apparatus comprising:

A. a bracket having a first leg, a second leg, and a connecting portion between said first and second legs;

B. means for fixing said bracket to a watercraft;

C. an elongated channel member, said channel member being provided with a pair of aligned notches on spaced apart sides thereof and proximate a first end thereof;

D. a reel assembly;

E. shaft means rotatably supporting said reel assembly, said shaft means being rigidly fixed to said channel member proximate a second end thereof;

F. a first rectangular aperture in said first leg of said bracket, said first rectangular aperture being dimensioned and configured to receive said channel member with sliding clearance;

G. a second rectangular aperture in said second leg of said bracket, said second rectangular aperture being dimensioned and configured to receive said channel member with sliding clearance; and

H. spring means supported on said bracket and adapted to urge said notches proximate said second end of said channel into engagement with an edge of said second rectangular aperture.

2. The towline pay-out and retrieval apparatus of claim 1 in which said spring means is oriented on said

bracket to urge said second end of said channel toward said bracket connecting portion whereby said notches engage an edge of second rectangular aperture nearest said connecting portion.

3. The towline pay-out and retrieval apparatus of claim **2** in which:

A. said shaft means comprises a rod having first and second right angle bends providing first and second rod end portions parallel to one another;

B. said reel means being rotatably journalled on said first rod end portion; and

C. said second rod end portion being rigidly fixed to said channel proximate said first end thereof, said second rod end portion being positioned outwardly from said first leg of said bracket when said notches engage an edge of said second rectangular aperture.

4. The towline pay-out and retrieval apparatus of claim **3** which further includes:

A. a brake lever fixed at a pivot point to said shaft means proximate said first right angle bend, said brake lever having first, second, and third edges disposed, respectively, first, second, and third distances from said pivot point;

B. said reel assembly having first and second sides and a hub extending therebetween; and

C. a spring washer disposed on said upper rod end portion between said first side of said reel assembly and said pivot point

whereby rotation of said brake lever about said pivot point selectively brings said first, second, and third edges thereof to bear against said spring washer such that said spring washer is variably urged against said first side to provide first, second, and third degrees of reel braking.

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